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SUBJECT—

TITLE

REPORT OF PINE BEETLE SURVEYS
ON THE
WENATCHEE NATIONAL FOREST, WASHINGTON
SUMMERS OF 1940 AND 1941

By

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February 26, 1942

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REPORT OF PINE BEETLE SURVEYS ON THE WENATCHEE NATIONAL FOREST, WASHINGTON SUMMERS OF 1940 AND 1941

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INTRODUCTION

The ninth and tenth pine beetle surveys in portions of the ponderosa pine stands of the Wenatchee National Forest, Washington, were completed during the periods of August 22-27, 1940 and October 30-November 3, 1941 respectively. These surveys, part of a regional cooperative undertaking between the Forest Service, Indian Service, and the Bureau of Entomology and Plant Quarantine, have the three following objectives: (1) To follow the infestation trends of forest insects, particularly those of the western pine beetle (Dendroctonus brevicomis Lec.); (2) to locate areas of epidemic infestation warranting direct control measures; and (3) to define the types of trees and areas most susceptible to insect attack which should be given consideration in forest management plans.

Two types of surveys were conducted. Intensive surveys were made on five 320-acre plots in 1940 and on three plots in 1941 (see table I) by three-man crews composed of the following personnel:

1940 crew - R. M. Ramstad, J. E. Weaver, and G. G. Black

1941 crew - F. E. Kimedy, G. W. Summerside, and H. A. Dahl

The former crew received detailed survey instructions at a ten-day training school held at Camp Sherman, Oregon for the personnel of the Forest Service and Bureau crews. The 1941 crew was instructed in the field by Mr. A. J. Jaenicke of the Forest Service. Extensive or observational surveys over most of the 544,000 acres of commercial ponderosa pine of this forest were made by the writer during the period of August 22-26, 1940, but were not made in 1941. From these two surveys, estimates of the total insect-caused ponderosa pine depletion for the forest as a whole were made.

RESULTS OF THE 1941 SURVEY

A summary of the 1941 check plot cruising data will be found in table II. This survey was made at a time when approximately 82 percent (Grant's curve) of the probable losses for the year were marked by the crew. Estimated ponderosa pine losses on two plots were lower than those of 1940 and higher on one plot. The estimated volume losses for the three plots show a ratio of 1.13 to those of 1940 with a slightly smaller number of trees killed in 1941. Practically all of the losses are attributable to the western pine beetle, with a small percentage of the total annual loss credited to the mountain pine beetle (Dendroctonus monticolae Hopk.) and to the California pine flathead (Melanophila californica VD). No control measures are necessary at this time.

RECENT LOSSES

Two previous reports by the writer, bearing the same titles as the present report but dated December 1938 and March 1940, summarize the loss data prior to 1938. Table III presents the results of the plot surveys on 5 plots for the period 1938-1940 inclusive. (The Liberty and Mission Creek plots were cruised once in 1940 but were cut-over before a second cruise could be made, hence the 1940 losses have been estimated.) During this three-year period, the ponderosa pine mortality has averaged 29 board feet per acre per year and .35 percent of the stand per year. This rate is indicative of a normal infestation, which, for the most part, has probably been offset by annual growth.

GENERAL FOREST CONDITIONS

As a result of the two types of surveys, estimates of the total ponderosa pine depletion for the Wenatchee National Forest and the stands of other ownerships immediately adjacent to the forest have been prepared. These estimates, for 1939 and 1940, are given in table IV and the general condition in 1940 is shown in figure I. It will be noted from this map, as well as in table III, that these surveys have uncovered no portions of the Wenatchee National Forest needing immediate protection from forest insect depredations. While liquidation of the present timber crop in and around the Wenatchee National Forest is progressing at a rapid rate, it is recommended that consideration be constantly given to the removal of as much insect-susceptible timber as possible. By so doing, two worth while practices will result. First, the stands will be left in a more vigorous growing condition, and second, the high values represented by the over-mature trees will be utilized before they are destroyed by insect attacks. The Forest Insect Laboratory at Portland, Oregon, offers cooperative assistance in determining the types of trees and the areas needing attention from a timber salvage or sanitation standpoint.

RECOMMENDATIONS

It is recommended that another check plot and observational survey be made, if at all possible, in 1942. Because the insect loss data become increasingly valuable with each year's survey, these surveys should be continued. It is also recommended that the removal or salvage of mature and over-mature trees that are highly susceptible to insect attack be carried out on present and contemplated timber sales.

SUMMARY

A brief review of pine beetle surveys during the summers of 1940 and 1941 in the ponderosa pine stands within and adjacent to the Wenatchee National Forest, Washington, is presented.

Nearly all of the ponderosa pine insect-caused depletion on this forest is the result of attacks by the western pine beetle. The losses have been persistent but during the past few years have not been serious.

Since the low in 1937, the losses increased in 1938 and then decreased during the next two years.

The estimated losses for 1941 are approximately 13 percent higher than those of 1940. No direct control work has been necessary and none is recommended at this time.

Table I. Description of the survey check plots, Wenatchee National Forest, Washington

Infestation area	Check plots: Name	Location: T.	R.	Sec.	Elev. (feet)	Type	Site quality	Acres: Total	Pine timbered	Ponderosa pine (board feet): As of Jan. 1, 1940	Per acre
Ellensburg	Liberty	21N	17E	24N/2	3,000-3,600	.20 (27)	III-	320	320	3,270,000	10,200
Wenatchee	Mission Creek	21N	19E	3N/2	3,000-3,500	20.5	IV	320	320	2,110,000	6,600
	Van Creek	25N	18E	12N/2	2,500-4,000	20.5	IV	320	240	1,750,000	7,300
	Leavenworth	25N	19E	6N/2	2,500-5,800	20.5	IV+	320	320	2,960,000	8,900
Entiat	Preston Creek	28N	19E	35N/2	2,900-3,250	20.5	IV	320	320	3,700,000	11,500

Table II. Summary of ponderosa pine check plot losses, Wenatchee National Forest, Washington
Summer survey of 1941

Check plot	1940 losses: Trees: First cruise	Trees: Total	Volume (bd.ft.)	Date of cruise	1941 losses: Partial loss: Trees	Partial loss: Volume	Predicted total losses: Trees	Volume (bd.ft.)	Per acre	% of stand	Ratio to 1940
Van Creek	11	21	8,780	10/31/41	9	5,500	11	7,000	29	.40	.80
Leavenworth	18	44	14,240	11/3/41	30	10,070	37	12,000	37	.41	.84
Preston Creek	26	35	11,230	10/30/41	34	16,780	42	20,000	63	.54	1.78
Total	55	100	34,250		73	32,250	90	39,000	44	.46	1.13

Table III. Summary of recent ponderosa pine check plot losses
Wenatchee National Forest, Washington

Check plot	1938 losses					1939 losses					1940 losses				
		Volume (board feet)					Volume (board feet)					Volume (board feet)			
	Trees	Total	Per acre	% of stand	Ratio to 1937	Trees	Total	Per acre	% of stand	Ratio to 1938	Trees	Total	Per acre	% of stand	Ratio to 1939
Liberty*	20	9,700	30	.30	1.35	21	7,010	22	.21	.72	21	10,000	31	.31	1.42
Mission Creek*	13	15,350	48	.72	4.40	16	6,540	20	.31	.43	9	6,500	20	.31	1.00
Van Creek	4	2,600	8	.15	.68	16	7,090	22	.41	2.73	21	8,780	27	.50	1.24
Leavenworth	13	5,980	19	.20	.93	24	10,440	33	.35	1.75	44	14,240	45	.48	1.36
Preston Creek**						42	21,980	69			35	11,230	35	.30	.51
Total	50	33,530	26	.33	1.61	119	53,060	35	.39	.92	130	50,750	33	.37	.95

*Plots cut-over in 1940. Losses for 1940 have been estimated, based on partial surveys.
**-Established in 1940

Table IV. Estimated 1939 and 1940 ponderosa pine insect-caused depletion
Wenatchee National Forest, Washington

Infestation area	Ponderosa pine		1939 losses				1940 losses			
		Volume		Volume (board feet)				Volume (board feet		
	Acres	(M.bd.ft.)	Trees	Total	Per acre	% of stand	Trees	Total	Per acre	% of stand
Ellensburg	200,000	1,100,000	6,500	2,500	13	.23	7,000	3,000	15	.27
Wenatchee	230,000	950,000	6,000	3,500	15	.37	7,000	4,000	18	.42
Entiat	114,000	460,000	4,000	2,000	18	.44	3,000	1,000	10	.22
Forest total	544,000	2,510,000	16,500	8,000	15	.32	17,000	8,000	15	.32

LEGEND

WESTERN PINE BEETLE SURVEYS

WENATCHEE NATIONAL FOREST, WASHINGTON

1949 INFESTATION

Normal infestation
0-25 trees per section

Normal infestation
25-50 trees per section

Light epidemic infestation
50-100 trees per section

Cut-over areas

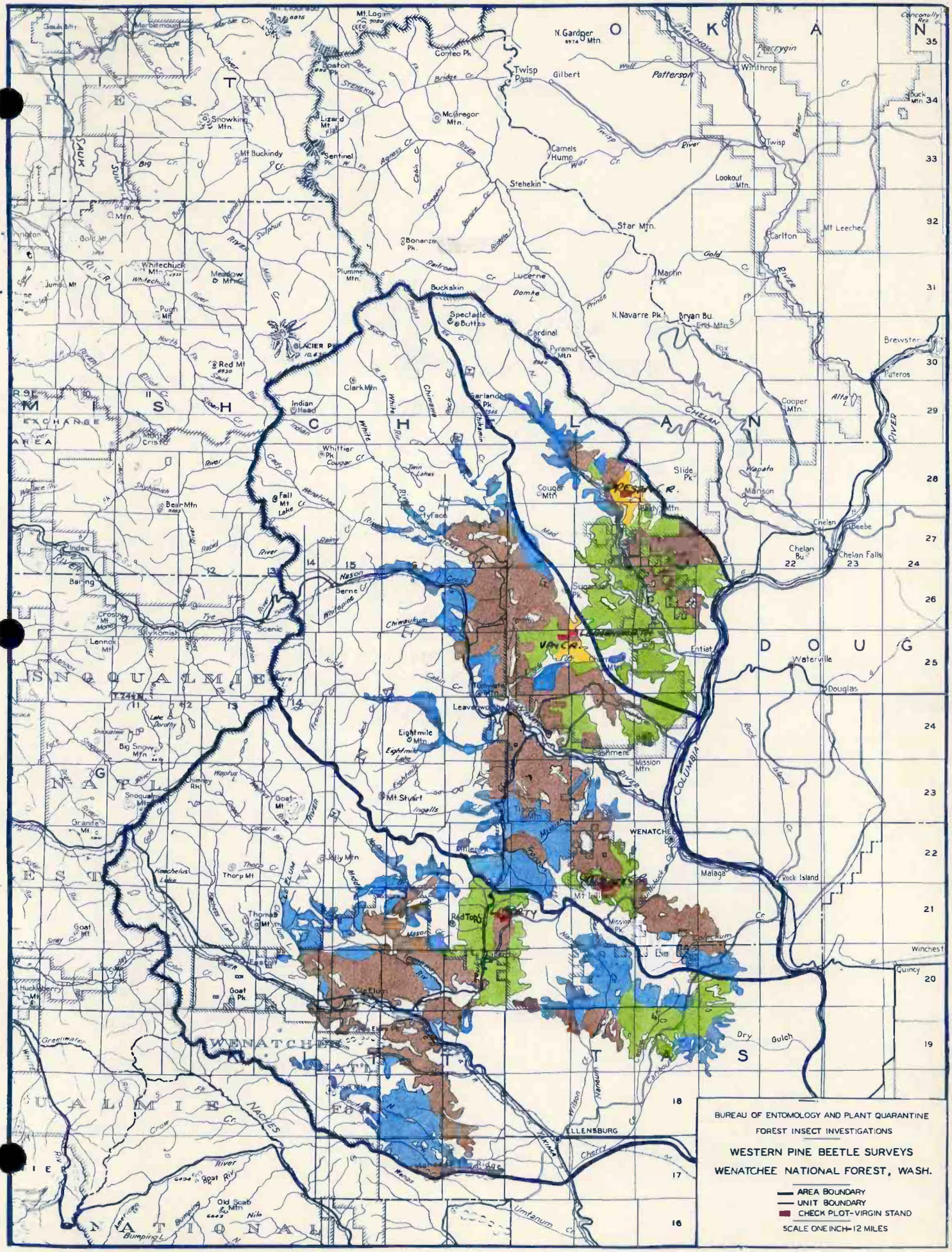
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS
WESTERN PINE BEETLE SURVEYS
WENATCHEE NATIONAL FOREST, WASH.
AREA BOUNDARY
UNIT BOUNDARY
CHECK PLOT-VIRGIN STAND
SCALE ONE INCH=12 MILES

FIGURE I.